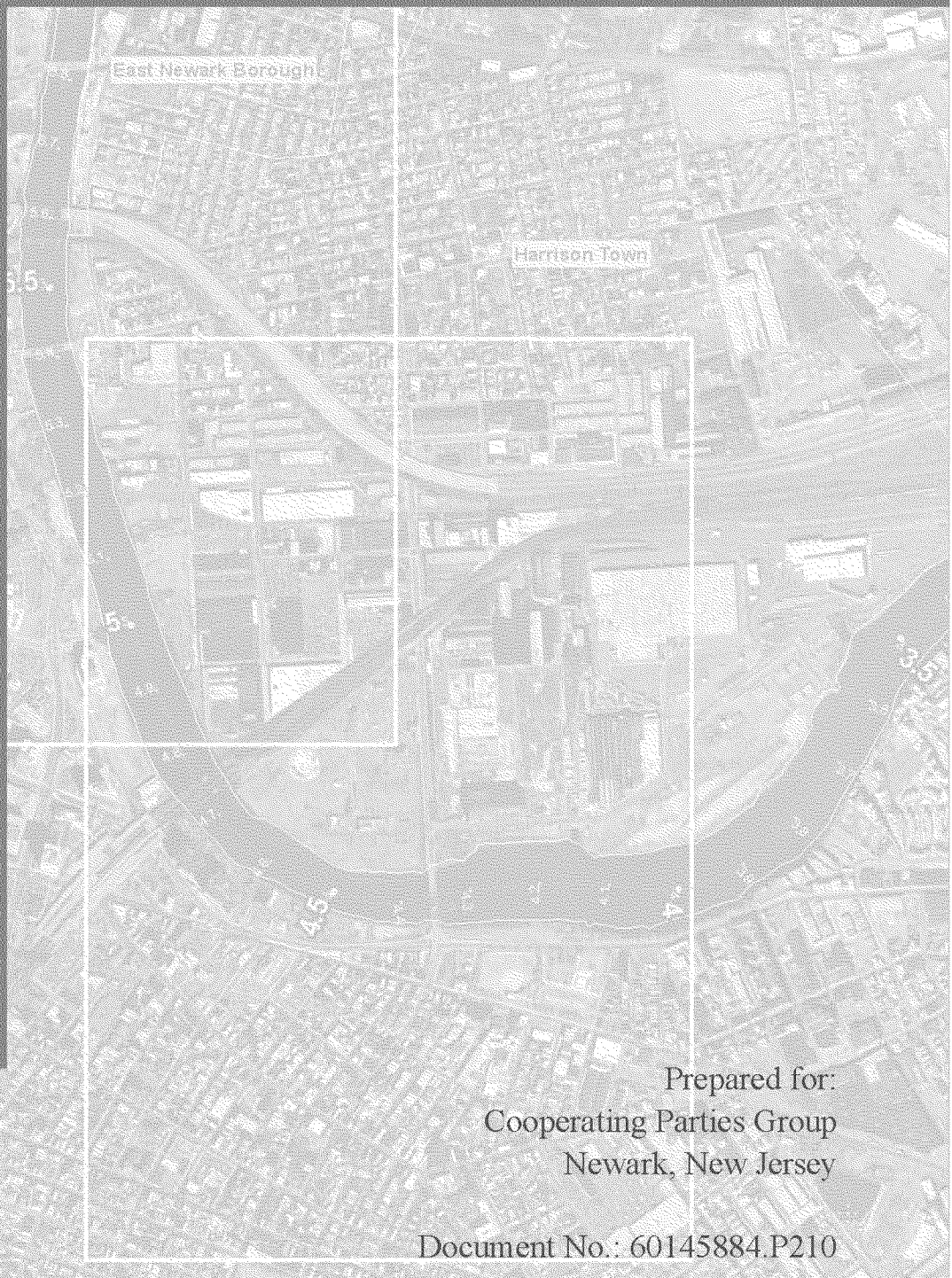
Quality Assurance Project Plan
Lower Passaic River Restoration Project

River Mile 10.9 Characterization Addendum A
Sediment Collection for Bench-Scale Testing of Sediment Treatment and Dewatering Technologies and for Additional Delineation

June 2012, Rev. 2



Prepared for:
Cooperating Parties Group
Newark, New Jersey

Document No.: 60145884.P210

CV011006a

AECOM

Quality Assurance Project Plan

River Mile 10.9 Characterization Addendum A
Sediment Collection for Bench-Scale Testing of Sediment Treatment and Dewatering Technologies and for Additional Delineation
Lower Passaic River Restoration Project
New Jersey

Lower Passaic River Study Area

River Mile 10.9 Characterization Addendum A

Sediment Collection for Bench-Scale Testing of Sediment Treatment and Dewatering Technologies and for Additional Delineation

~~May~~ June 2012

Revision ~~1~~2

Approved By: Debra L. Simmons

Debra L. Simmons, Project QA Manager

Date: ~~May 18~~June ~~22~~5, 2012

Approved By:

Douglas E. Simmons Task Manager

Date: ~~May 18~~June ~~22~~5, 2012

Table 1. QAPP Worksheet Key

Worksheet No.	Worksheet Title	RM 10.9 QAPP Worksheets			RM 10.9 QAPP Addendum Worksheet
		No Changes	Changes - Additions	Changes - Exclusions	
1	Title and Approval Page				Replacement
2	QAPP Identifying Information		Updated to reflect Addendum, scoping session and to add RM 10.9 QAPP to list of documents		Replacement
3	Distribution List		Added AECOM Task Manager, sediment treatment vendors, and dewatering treatment vendor		Changes only
4	Project Personnel Sign-Off Sheet		Added sediment treatment vendors, and dewatering treatment vendor		Changes only
5	Project Organizational Chart				Replacement
6	Communication Pathways		Added AECOM Task Manager, sediment treatment vendors, and dewatering treatment vendor		Replacement
7	Personnel Responsibilities and Qualifications Table		Added AECOM Task Manager, sediment treatment vendors, and dewatering treatment vendor		Replacement
8	Special Personnel Training Requirements Table	X			see RM 10.9 QAPP Worksheet
9	Project Scoping Session Participants Sheet		Added April 19, 2012 Addendum Scoping Season		Changes Only
10	Problem Definition				Replacement
11	Project Quality Objectives/Systematic Planning Process Statements				Replacement
12	Measurement Performance Criteria Table			Addendum target analytes only	see RM 10.9 QAPP Worksheet
13	Secondary Data Criteria and Limitations Table		Added RM 10.9 analytical sediment secondary data		Changes only

Table 1. QAPP Worksheet Key

Worksheet No.	Worksheet Title	RM 10.9 QAPP Worksheets			RM 10.9 QAPP Addendum Worksheet
		No Changes	Changes - Additions	Changes - Exclusions	
14	Summary of Project Tasks				Replacement
15	Reference Limits and Evaluation Table		Added PCDD/PCDF homolog groups	Addendum target analytes only	~~NA~~Changes only
16	Project Schedule/Timeline Table				Replacement
17	Sampling Design and Rationale				Replacement
18	Sampling Locations and Methods/SOP Requirements Table				Replacement
19	Analytical SOP Requirements Table			Addendum target analytes only	see RM 10.9 QAPP Worksheet
20	Field Quality Control Sample Summary Table				Replacement
21	Project Sampling SOP Reference Table		Core sampling and sediment processing SOP modifications, and inclusion of surface water sampling SOP		Changes only
22	Field Equipment			Bathymetry equipment not applicable	see RM 10.9 QAPP Worksheet
23	Analytical SOP Reference Table		Analytical Perspectives PCDD/PCDF SOP modification for a minimum 5 g aliquot	Addendum target analytes only	SOP modification only
24	Analytical Instrument Calibration Table			Addendum target analytes only	NA
25	Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table			Addendum target analytes only	see RM 10.9 QAPP Worksheet

Table 1. QAPP Worksheet Key

Worksheet No.	Worksheet Title	RM 10.9 QAPP Worksheets			RM 10.9 QAPP Addendum Worksheet
		No Changes	Changes - Additions	Changes - Exclusions	
26	Sample Handling System	X			see RM 10.9 QAPP Worksheet
27	Sample Custody Requirements		Added sample nomenclature for bulk sediment and surface water samples		Changes only
28	QC Samples Table			Addendum target analytes only; equipment blanks, field duplicates, and batch QC samples not applicable to bulk sediment samples	see RM 10.9 QAPP Worksheet
29	Project Documents and Records Table	X			see RM 10.9 QAPP Worksheet
30	Analytical Services Table			Addendum target analytes only	see RM 10.9 QAPP Worksheet
31	Planned Project Assessment Table			Safety and technical audits not applicable	see RM 10.9 QAPP Worksheet
32	Assessment Findings and Response Actions			Safety and technical audits not applicable	see RM 10.9 QAPP Worksheet
33	QA Management Reports Table	X			see RM 10.9 QAPP Worksheet
34	Sampling and Analysis Verification (Step I) Process Table	X			see RM 10.9 QAPP Worksheet

Table 1. QAPP Worksheet Key

Worksheet No.	Worksheet Title	RM 10.9 QAPP Worksheets			RM 10.9 QAPP Addendum Worksheet
		No Changes	Changes - Additions	Changes - Exclusions	
35	Sampling and Analysis Validation (Steps IIa and IIb) Process Table	~~X~~	Added reference to Worksheet #15 for target analytes that will be validated.		~~see RM 10.9 QAPP Worksheet~~Replacement
36	Sampling and Analysis Validation (Steps IIa and IIb) Summary Table			Applies to Addendum target analytes only	see RM 10.9 QAPP Worksheet
37	Data Usability Assessment	X			see RM 10.9 QAPP Worksheet

QAPP Worksheet #1 (UFP-QAPP Manual Section 2.1) Title and Approval Page

Document Title: Quality Assurance Project Plan. River Mile 10.9 Characterization Addendum A – Sediment Collection for Bench-Scale Testing of Sediment Treatment and Dewatering Technologies and for Additional Delineation. Lower Passaic River Restoration Project.

Lead Organization: Cooperating Parties Group and de maximis, inc.

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Preparation Date (Day/Month/Year): Addendum A – Sediment Collection for Bench-Scale Testing of Sediment Treatment and Dewatering Technologies and Additional Delineation, Revision 0, May 2012; Revision 1, May 2012; Revision 2, June 2012.~~.~~

Investigative Organization's Project Manager

Laura Kelmar / AECOM / ~~May~~ June 2012

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Debra Simmons / AECOM / ~~May~~ June 2012

Lead Organization's Project Manager

Bill Potter / Robert Law / de maximis, inc. / ~~May~~ June 2012

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) Data Quality Levels and Analytical Method Evaluation

Matrix: Sediment
Analytical Group: PCDD/PCDFs, Method 1613B; Analytical Perspectives, Wilmington, NC
Concentration Level: Low

Analyte	CAS Number	DQL (mg/kg)[a]	Sediment RL from 2005 QAPP[b]	Project QL Goal (mg/kg)[c, l]	Analytical Method[d]		Achievable Laboratory Limits[e]	
					MDLs (mg/kg)	Method QLs (mg/kg)	EDLs (mg/kg)	QLs (mg/kg)[l]
1,2,3,4,6,7,8-HPCDD	35822-46-9	0.00045[f]	0.0000025	0.0000025	NA	0.0000050	0.00000034	0.0000025
1,2,3,4,6,7,8-HPCDF	67562-39-4	0.00045[f]	0.0000025	0.0000025	NA	0.0000050	0.00000021	0.0000025
1,2,3,4,7,8-HxCDD	39227-28-6	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000028	0.0000025
1,2,3,4,7,8-HXCDF	70648-26-9	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000026	0.0000025
1,2,3,4,7,8,9-HPCDF	55673-89-7	0.00045[f]	0.0000025	0.0000025	NA	0.0000050	0.00000030	0.0000025
1,2,3,6,7,8-HxCDD	57653-85-7	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000029	0.0000025
1,2,3,6,7,8-HXCDF	57117-44-9	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000025	0.0000025
1,2,3,7,8,9-HxCDD	19408-74-3	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000032	0.0000025
1,2,3,7,8,9-HXCDF	72918-21-9	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000031	0.0000025
1,2,3,7,8-PeCDD	40321-76-4	0.0000045[h]	0.0000025	0.0000025	NA	0.0000050	0.00000022	0.0000025
1,2,3,7,8-PECDF	57117-41-6	0.00015[i]	0.0000025	0.0000025	NA	0.0000050	0.00000019	0.0000025
2,3,4,6,7,8-HXCDF	60851-34-5	0.000045[g]	0.0000025	0.0000025	NA	0.0000050	0.00000026	0.0000025
2,3,4,7,8-PECDF	57117-31-4	0.000015[j]	0.0000025	0.0000025	NA	0.0000050	0.00000018	0.0000025
2,3,7,8-TCDD	1746-01-6	0.00000012	0.00000050	0.00000012	NA	0.0000010	**0.00000015**	**0.0000010**
2,3,7,8-TCDF	51207-31-9	0.000045[g]	0.00000050	0.00000050	NA	0.0000010	0.00000012	**0.0000010**
OCDD	3268-87-9	0.015[k]	0.0000050	0.0000050	NA	0.000010	0.00000041	0.0000050
OCDF	39001-02-0	0.015[k]	0.0000050	0.0000050	NA	0.000010	0.00000034	0.0000050
Total TCDD	41903-57-5	NA	NA	0.00000050	NA	NA	NA	0.00000050
Total PeCDD	36088-22-9	NA	NA	0.0000025	NA	NA	NA	0.0000025

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) Data Quality Levels and Analytical Method Evaluation

Analyte	CAS Number	DQL (mg/kg)[a]	Sediment RL from 2005 QAPP[b]	Project QL Goal (mg/kg)[c, l]	Analytical Method[d]		Achievable Laboratory Limits[e]	
					MDLs (mg/kg)	Method QLs (mg/kg)	EDLs (mg/kg)	QLs (mg/kg)[l]
Total HxCDD	34465-46-8	NA	NA	0.0000025	NA	NA	NA	0.0000025
Total HpCDD	37871-00-4	NA	NA	0.0000025	NA	NA	NA	0.0000025
Total TCDF	55722-27-5	NA	NA	0.00000050	NA	NA	NA	0.00000050
Total PeCDF	30402-15-4	NA	NA	0.0000025	NA	NA	NA	0.0000025
Total HxCDF	55684-94-1	NA	NA	0.0000025	NA	NA	NA	0.0000025
Total HpCDF	38998-75-3	NA	NA	0.0000025	NA	NA	NA	0.0000025

Note: Bold indicates chemicals for which the achievable laboratory limits exceed the project QL goal. Refer to Worksheet #37 for details on the data usability assessment with regard to sensitivity.

[a] DQLs based on the lower of : 1) NJDEP, 2008. New Jersey Department of Environmental Protection Soil Remediation Standards (SRSs) for residential soil (http://www.state.nj.us/dep/srp/regs/rs//), 2) USEPA RSLs for residential soil, May 2011, and 3) applicable ecological thresholds based on No observable adverse effects level (NOAELs), Toxicity reference value (TRVs), Apparent effects threshold (AETs), Effects range-low (ER-Ls) and Threshold effects level (TELs). RSLs for non-carcinogenic compounds were divided by a factor of 10 to adjust for a hazard index of 0.1 to account for potential additive effects. DQLs are analytical goals listed solely for the purpose of evaluating laboratory analytical methods and achievable laboratory limits; these are not project-specific screening levels or PRGs and are not approved by the USEPA as the appropriate risk assessment criteria for this project. These values will be developed in subsequent phases of the project.

[b] RLs were taken from Tables 2-1 through 2-21 (MPI QAPP, Lower Passaic River Restoration Project, August 2005).

[c] The project QL goal is selected as the lower of the DQL and the Sediment RL.

[d] Analytical MDLs and QLs are those documented in validated methods. "NA" indicates that MDL and/or QL values were not included in the validated methods.

[e] Achievable EDLs (based on laboratory averaged EDLs) and QLs are limits that an individual laboratory can achieve when performing a specific analytical method. Actual EDLs and QLs will vary based on percent moisture and other sample-specific factors. For PCDD/PCDFs, the EDL and QL are based on extraction of 10 grams/sample. The laboratory reporting detection limit will be based on the sample specific EDL. Matrix interference can increase EDLs by as much as a factor of 10x.

[f] DQL based on RSL for 2,3,7,8-TCDD divided by a TEF of 0.01 (Van den Berg, et al., 2006)

[g] DQL based on RSL for 2,3,7,8-TCDD divided by a TEF of 0.1 (Van den Berg, et al., 2006)

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) Data Quality Levels and Analytical Method Evaluation

[h] DQL based on RSL for 2,3,7,8-TCDD divided by a TEF of 1 (Van den Berg, et al., 2006)
[i] DQL based on RSL for 2,3,7,8-TCDD divided by a TEF of 0.03 (Van den Berg, et al., 2006)
[j] DQL based on RSL for 2,3,7,8-TCDD divided by a TEF of 0.3 (Van den Berg, et al., 2006)
[k] DQL based on RSL for 2,3,7,8-TCDD divided by a TEF of 0.0003 (Van den Berg, et al., 2006)[l] The QL for each homolog group is equivalent to the highest QL of any congener in that homolog group.
[l] The QL for each homolog group is equivalent to the highest QL of any congener in that homolog group.

QAPP Worksheet #35 (UFP-QAPP Manual Section 5.2.2)Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description	Responsible for Validation
IIa	Field SOPs, field records	Verify conformance to approved sampling and field measurement procedures; ensure that activities met performance criteria; and verify that deviations from procedures or criteria were documented.	Debra Simmons, Project QA Manager/AECOM
IIa	Analytical data deliverables, contractual documents	Verify the required deliverables, analyte lists, method holding times, analytical procedures, laboratory qualifiers, measurement criteria, project quantitation limits, and analyses of PE samples conform to specifications. Verify that deviations from procedures or criteria were documented.	Lisa Krowitz, Validation Coordinator/AECOM
IIa	Field records, database output	Verify transcription of field data from field forms to database.	Jim Herberich, Data Management Task Manager/AECOM
IIa	Custody records, analytical data reports	Review traceability from sample collection through reporting.	Lisa Krowitz, Validation Coordinator/AECOM
IIa	Laboratory EDDs, analytical data reports, database output	Verify EDDs against hard-copy analytical reports.	Jim Herberich, Data Management Task Manager/AECOM
IIa	Data validation reports, database output	Verify that entry of qualifiers was correct and complete.	Lisa Krowitz, Validation Coordinator/AECOM
IIb	Analytical data reports	Verify that reported analytes, holding times, analytical procedures, measurement criteria, and project quantitation limits conform to the QAPP. Verify that deviations from procedures or criteria were documented.	Lisa Krowitz, Validation Coordinator/AECOM
IIb	Analytical data reports, validation guidance	One hundred percent of the data will be validated (see details below).	Lisa Krowitz, Validation Coordinator/AECOM
IIb	QAPP, analytical data reports, validation guidance	Verify that the qualifiers applied during validation were in conformance with the QAPP and specified validation guidance.	Lisa Krowitz, Validation Coordinator/AECOM
IIb	Analytical data	Verify that PE samples were analyzed at the frequency specified in the QAPP	Lisa Krowitz, Validation

QAPP Worksheet #35 (UFP-QAPP Manual Section 5.2.2)Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description	Responsible for Validation
	reports	and met the acceptance criteria.	Coordinator/AECOM
IIb	QAPP, data validation reports	Verify that data validation was performed in accordance with the QAPP specifications and that all required peer reviews were conducted. If validation actions deviated from the QAPP specifications and/or regional validation guidance based on professional judgment, verify that rationale was documented.	Debra Simmons, Project QA Manager/AECOM

Data Validation

Validation of each analytical group will be limited to the target analytes listed in Worksheet #15 for that group. At a minimum, 100% full validation (includes review of raw data and spot check for verification of calculations) will be conducted for PCDDs/PCDFs (the 2, 3, 7, 8-substituted Congeners and Homologs listed in Worksheet #15), and all 209 PCB Congeners and Homologs ~~and Congeners~~ for each sample delivery group (SDG) For all other parameters, 100% full validation (as appropriate to the analyses) will be performed on the first two SDGs. The remaining SDGs will be subject to full validation at a twenty percent frequency and limited validation for the remaining SDGs.

Limited validation will be based on information provided by the laboratory on their QC forms, and will include no or minimal raw data review. At a minimum, limited validation will include the following data elements:

- Agreement of analyses conducted with COC requests
- Holding times and sample preservation
- Initial and continuing calibrations and analytical sequence
- Mass spectrometer tuning (GC/MS only)
- Internal standard performance (GC/MS only)
- Laboratory blanks/equipment blanks/ field blanks/ trip blanks
- Surrogate recoveries
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results

QAPP Worksheet #35 (UFP-QAPP Manual Section 5.2.2)Validation (Steps IIa and IIb) Process Table

- Matrix spike/matrix spike duplicate (MS/MSD) results
- Laboratory duplicate results
- Field duplicate results
- Interference check sample (ICS) results (AB solution only)
- Inductively Coupled Plasma (ICP) serial dilution results
- Chemical yield (tracers and carriers) (radiochemical only)
- Percent solids
- Quantitation limits and sample results (limited to evaluating dilutions and reanalyses)

If significant issues (e.g., those affecting achievement of the DQOs) are noted during full validation, the limited validation will be expanded to include this issue. Systematic or random errors that would not be detected during a review of the summary forms might include, for example, misidentification or quantitation of compounds, transcription errors, or calculation errors. In addition, limited validation will provide review of key laboratory QC elements, which would highlight potential underlying lab issues which may require further investigation (i.e., full validation effort). If a high frequency of measurement performance issues are found, the issue will be investigated and an additional validation effort may be implemented. AECOM plans to maintain communication/notification systems with the laboratory during the analytical process to circumvent significant QC issues. If QC issues do arise, investigations and corrective actions will be documented and implemented in a timely fashion to optimize the amount of un-qualified data.

In addition, data packages receiving limited validation will receive a completeness check so that full validation could be performed at a later data, if necessary. The check will verify that the raw data for each sample (including all reanalyses and dilutions) are present and complete. The data supporting the sample results, such as QC samples (method blanks, LCS, MS/MSD), calibrations, tunes, and preparation logs, will also be reviewed for overall completeness, however, an in-depth inventory to ensure specific association with all sample data will not be performed.

No additional completeness check will be performed for the geotechnical tests due to limited back-up information provided and the nature of the tests.

QAPP Worksheet #35 (UFP-QAPP Manual Section 5.2.2)Validation (Steps IIa and IIb) Process Table

Validation qualifiers will be applied based on the criteria in the QAPP, method-specific Region II validation SOPs, or professional judgment. These will be limited to "J", "UJ", "K", and "NJ", as defined in the Region II validation SOPs.

Reports summarizing data qualification as a result of the validation effort will be prepared.